and similar to the ordinary cicatriculæ, or is it the result of the early fusion of two primarily distinct cicatriculæ or germs? Since M. Balbiani has shown how the germ is formed in the ovule, we may consider whether certain ovules may not contain a cicatricula apparently simple, but formed by the fusion of two originally distinct germs. And the coexistence of two germs within a single ovule is proved by the coexistence of two separate cicatriculæ upon the same vitellus.

The author has recently observed an egg presenting a very singular arrangement, but which is explained by a combination of the two cases above described. In this there were two transparent areas upon a single blastoderm and in a single vascular area, the latter of a very abnormal form. One of the transparent areas was normal, and presented a normal embryo; the other, of an irregular form, presented two embryos, one normal, the other abnormal. This fact, although apparently very complex, may be very simply explained by the coexistence upon the same vitellus of two distinct cicatriculæ, one normal, the other formed by the fusion of two germs, and by the production of a single blastoderm from these cicatriculæ during incubation.—*Comptes Rendus*, March 20, 1865, p. 562.

On two Starfishes from Costa Rica. By E. von Martens.

On the 16th January Dr. E. von Martens communicated to the Academy of Sciences at Berlin a description of two species of Starfishes from Costa Rica. The first of these is the *Oreaster armatus*, Gray, which is described as follows:—

1. *Oreaster armatus*, Gray, sp.

Body pentagonal, with strongly incurved sides; proportion of the radius of the disk to that of the arms as 1 to $1\frac{1}{2}$ nearly. Dorsal surface but little elevated. Ambulacral papillæ in two rows; on the inner plates three and more, rarely two, placed close together upon each plate; on each of the outer plates one larger papilla. The plates of the ventral surface are thickly set with globular granules, and bear on the middle of each a large cylindrical tubercle which is obtuse at the apex. The lower marginal plates belong entirely to the ventral surface: they are thickly set with globular granules, and bear in the middle of each a larger, conical, moderately acute spine, which is villous, like satin, and the narrowed flat base of which is surrounded, as by a wall, with the granules of the marginal plate itself. There are seventeen inferior marginal plates between the apices of each pair of arms; they are all nearly square. The superior marginal plates, which alone form the margin, are twice as high as their breadth in the middle of the space between two arm-tips; towards the latter they become broader in proportion, and finally nearly square. Their number between each pair of arm-tips is fourteen. They are beset with granules, in the same manner as the inferior marginal plates, and bear a precisely similar spine in their middle; many of them, however, are destitute of the spine and even of every

trace of its insertion, whilst on all the inferior plates, when the spine has been lost, the place to which it was attached is distinctly recognizable. The marginal plates all fit accurately together without intervening granules. The dorsal surface is covered with smaller, polygonal, convex plates, also densely granulated; the granules resemble those of the marginal plates, and are smaller and less elevated than those of the ventral surface. The back of each arm forms a blunt radial elevation (but not a sharp keel), along which there is a simple series of spines, formed like those of the marginal plates, but larger. Near the middle, the five elevations unite to form an annular wall, which encloses a somewhat depressed central surface. A few larger spines stand on this central surface, but without being definitely arranged in any of the five radial rows. Lastly, one larger spine stands in the middle line of each interradial space, near the margin. No pedicellariæ are to be found on the single specimen.

Radius of the disk 48, of the arms 69 millim. Height of the dry specimen, without the spines, 18 millim.

Islas los Negritos, in the Gulf of Nicoya, Costa Rica; collected by M. Hoffmann in 1857, and afterwards sent to the Berlin Museum. Colour, when alive, tile-red, according to Hoffmann's notes.

In the 'Annals and Magazine of Natural History,' vol. vi. p. 277 (1840), Dr. Gray briefly described a new species under the name of *Pentaceres armatus*; he gives as its habitat Punta Santa Elena. He founds upon it a peculiar subgenus, *Nidorellia*, which he characterizes as follows:—"Back regularly convex, formed of flat granular ossicula, with a blunt mobile spine on the centre of each ossiculum below; arms short and broad."

Müller and Troschel were not acquainted with this species, and under the name of *Oreaster armatus* they merely give a German translation of Gray's words, in which, however, they omit the word "below," evidently because they could not understand Gray's extremely obscure mode of expression without comparison with a specimen. Hence must have originated the misconception which represents it as if each plate on the dorsal surface bore a spine, which, however, is not the case, as I have ascertained from the original specimen in the British Museum. Dujardin and Hupé (Hist. Nat. des Zoophytes Echinodermes, p. 387) retranslate the above translation into French, without adding anything new, except an error and a fresh cause of error. In the first place, of the words "the inferior marginal plates and the three last superior ones, &c., with spines," they have overlooked the little word "superior," and translated them "les plaques marginales inférieures et plus particulièrement les trois dernières." In the second place, they give as the habitat simply "Sainte-Hélène," from which every one would at once be led to think of the well-known island in the South Atlantic Ocean, and not of the Cape on the west coast of Ecuador, not far from Guayaquil. Under these circumstances I considered it by no means unnecessary to give a detailed description of the species after the fashion of those drawn up for other species by Müller and Troschel, even without the particular circumstance which I have now to mention, and to which

my attention was called by Professor Beyrich. The larger spines along the dorsal line of the arms in the dried specimen are partly erect and partly depressed, which certainly could arise only from local differences in the shrinking during the desiccation of the specimen, but still produces an impression that the spines must have been moveable during life—a view which is further borne out both by the smoothness of the base of the spine and by that of the surface to which it is attached, although this is surrounded by granules, and from it even the dry spines may be very easily detached. Gray also describes the spines as mobile.

In living Oreasters of the Indian Archipelago, however, I have never noticed any mobility of the spines independent of their point of attachment, but I ascribed their convergence after death to the locally unequal shrinking of the entire surface; nevertheless in these Indian species I do not now find the spines so distinctly differentiated from their point of attachment as in the Central American species.

2. *Astropecten cœlacanthus*, n. sp.

Five arms; radius of the disk to that of the arms about as 1 to 3. Marginal plates twenty-four on each arm. Ambulacral papillæ in several rows, the outer ones larger, all somewhat compressed and obtuse. From the scaly covering of the ventral plates larger flat spines project everywhere, and near the margin especially these group themselves in rows parallel to the margin, consisting of three spines for each inferior plate; on the margin itself there is on each of these plates one spine. These marginal spines are small and flat in the interbrachial angles, as also at the apex of the arms; in the middle of the arms they are large, flat, slightly sabre-shaped, and bent round on the free margins in such a manner as to present a spoon-like cavity, directed downwards and backwards (that is to say, towards the interbrachial angle). The superior marginal plates are twice as deep as broad, densely granulated, with a few (2–4) larger tubercles, which stand in a transverse row, and of which the innermost (superior) especially are never wanting. The back, arms, and disk within these marginal plates are thickly set with paxillæ; in the middle of the arms this space is scarcely twice as broad as the height of one of the superior marginal plates.

Radius of the disk 17, of the arms 49 millim.; height in the middle 8 millim. Captured and sent with the preceding species.—*Monatsber. der Akad. der Wiss. zu Berlin*, January 1865, p. 56.

Occurrence of Calluna vulgaris *in Newfoundland.*

Mr. Murray, late of the Geological Survey of Canada, and now engaged in a survey of Newfoundland, has brought to Montreal specimens of this plant, which were collected by Judge Robinson on the east coast of Newfoundland, near Ferryland (lat. 47°, long. 52° 50′), and which are stated to be from a small patch of the plant not more than three yards square.—*Silliman's Journal*, March 1865.